REMARKS

As a preliminary matter, the Examiner's courtesy in the telephonic interview conducted on March 11, 2010 is acknowledged and appreciated. While no agreement on the outstanding rejections was reached, a plan for information that would be considered by the Examiner was formed. The discussion of Trau from the interview is continued in the following response. The Examiner's issuance of the supplemental final office action to address the elected claims is also acknowledged and appreciated.

The rejection of claims 34-39, 41-43 and 45 under §102 over Trau is traversed with respect to the amended claims. Specific issues from the interview and additional issues not discussed are addressed below.

The above amendments are made pursuant to the conference, and to the request of the Examiner for more detail in the physical structure of the film. The amendments to the independent claims emphasize the integral physical structured (structure of particle itself) that provides multiple interfaces and thicknesses of layers, as discussed, for example on page 7, lines 11-26.

The integral coding in the multiple layer film by interfaces and thicknesses has important advantages over Trau's polymerized particles that rely upon a "clear silicon shell" to produce particles having different sizes. Trau does not provide nor suggest the ability to have a multi-layer integral porosity for coding, but instead "different types of particles are made, each having a different thickness of optic coating." [0091]. As discussed in the interview, Trau either coats particles or alters them in some other manner (insertion of materials and the like) to change the scattering, but there is no recognition, suggestion, or ability to achieve like coding in the integral physical structure. There is a general porosity and Trau discloses producing optical responses by coatings and introduction of materials into the pores of the particle. There is no indication of separate regions of different porosity in a particle of Trau. Trau discloses spherical particles and does not anywhere discuss having regions of different thicknesses.

It is noted that the Examiner's citation of the different thickness of optical coating in Trau does not read upon or suggested the claimed multiple optical thicknesses that are part of the physical porosity structure. As stated on page 8 of the instant application, "A preferred embodiment is a particle 10 having multi-layer films 121-12N that have mismatched optical thicknesses. Optical thickness is defined as the refractive index of a layer multiplied by its metric thickness."

The rejection of claims 37-39 is separately traversed. As also mentioned in the interview, coating and filling pores as done in Trau precludes many powerful techniques such as analyte detection and the use of receptors within the pores. As Trau's pores are not open, they are not able to accept analyte, receptors, tags etc. Claim 37 has been amended to specify that the receptor is within the pores of the physical multi-layer porosity structure. Trau's particles prevent any such use of a receptor because try relies upon pores that are coated and filled. The coated and filled pores can't accept an analyte.

Similarly, claim 41 has been amended to require that the fluorescence tag is within the pores of the particle. As discussed with respect to claims 37-39, Trau's coated and filled pores will not accept a tag for assaying.

The rejection of claim 45 is separately traversed. This claim has also been amended. However, it is also disputed that Trau disclosed any library or ability to produce a library of particles according to claim 45. Trau does not disclose any form of varying porosity for coding, and certainly no capability for a library of particles having unique codes.

Generally, as explained in the interview, the claimed particles and invention enable a "code or group of codes…[to] reproduce the same optical signature over and over again, permitting the manufacture of films having the same codes. In addition, different codes may be selected from the library of codes to produce films having different optical signatures." P7, L6-10. Because the porous codes are an integral and orderly part of the porous structure, it is not possible for part of the code to be lost, scrambled or photobleached.

The layered porous-silicon encoded structures offer several advantages over

existing encoding methodologies. Porous-silicon encoded structures can be constructed that display features spanning the visible, near-infrared and infrared regions of the spectrum. With the invention claimed, compared to other coding techniques (including Trau's use of clear silicon coatings on particles to provide different sized particles) provides a more powerful and accurate coding scheme. Encoded films can be assayed using a conventional fluorescence tagging technique, and sensitive chemical and biochemical detection can also be built into the optical structure of the encoded films, which is not possible with Trau's particles that are sealed with a clear film or filled with other materials.

The rejection of claims 34-39, 41-43 and 45 over Chan is respectfully traversed with respect to the amended claims.

Chan utilizes prior work of some of the present inventors that is disclosed in U.S. Patent No. 6,248,539. C1, L 44-50. Chan utilizes Bragg reflectors formed of porous silicon around a central microcavity resonator layer. C2, L 52-65. The central layer is an active luminescent layer having a uniformly highly porous structure. C12, L25-37. The structure is formed on a substrate 18, which is "on a chip, wafer, etc." Nowhere does Chan suggest or disclose a "micron sized particle". Typical chips, wafers, etc. have diameters of inches, and Chan never discloses nor suggests the manufacture of any particles.

Chan also fails to disclose or suggest any predetermined code. The codes in Chan are established by a highly porous central layer that is stated to have a large porosity, but does not have multiple layers. C6, L25-30. Chan does not recognize or describe an ability to produce particular codes of a predetermined specific encoding structure. The portion of Chan cited in the office action does not produce an optical signature in the form of "an interference pattern in the reflectivity spectrum that uniquely corresponds to a single particular etching a code from a library of codes that was used to create the particle via a computer waveform controlled etch." Chan merely discloses high porosity central layers. Chan also fails to disclose or suggest, therefore, the "integral and ordered physical multi-layer porosity structure with multiple porosity interfaces between multiple porosity layers,

the multiple porosity layers having multiple optical thicknesses. As noted above, the claimed particles and invention enable a "code or group of codes…[to] reproduce the same optical signature over and over again, permitting the manufacture of films having the same codes. In addition, different codes may be selected from the library of codes to produce films having different optical signatures." P7, L6-10.

Claims 34-43 and 45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Trau and/or Chan in view of Ghadhiri et al., U.S. Patent No. 6,248,539 (the office action lists '530, but this appears to be a typo as Ghadihri is the '539 patent). The rejection is respectfully traversed.

Chan and Ghadihri are discussed above. Contrary to the statements in support of this rejection, Chan does not disclose any particles. Similarly, Ghadihri also fails to disclose any particles, but discloses an etched silicon wafer. C2, L.15-24. This prior work of some of the inventors also fails to discuss any ability to produce a "integral and ordered physical multi-layer porosity structure with multiple porosity interfaces between multiple porosity layers, the multiple porosity layers having multiple optical thicknesses. As noted above, the claimed particles and invention enable a "code or group of codes…[to] reproduce the same optical signature over and over again, permitting the manufacture of films having the same codes. In addition, different codes may be selected from the library of codes to produce films having different optical signatures." P7, L6-10.

Separately, the combination is objected to because Trau uses a fundamentally different basis of signal generation than Chan or Ghadihri. As discussed above, Trau does not provide nor suggest the ability to have a multi-layer integral porosity for coding, but instead "different types of particles are made, each having a different thickness of optic coating." [0091]. Neither Chan or Ghadihri disclose any particles, and Trau's system is one that relies on coatings. An artisan would not look to Trau's incompatible coatings to modify either Chan or Ghadihri, because both rely upon the introduction of substances into pores.

For all of the above reasons, applicants request reconsideration and allowance

of the application. Should the examiner believe that outstanding issues exist or that a conference would expedite prosecution, the examiner is invited to contact the undersigned attorney at the below listed number.

Respectfully submitted,

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